

Application Serial No.: 10/710,870

Attorney Docket No.: 00131-00322-US1

REMARKS

Claim 1-10 are pending in the application. Claim 11 has been withdrawn by way of the present amendment. Applicants respectfully request reconsideration.

In the outstanding Office Action, claims 1-3 and 5-10 were rejected under 35 U.S.C. § 103(a) as being unpatentable over by U.S. Patent No. 5,587,342 (Lin et al.) in view of U.S. Patent No. 6,534,422 (Ichikawa et al.); and claim 4 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Lin et al. in view of Ichikawa et al., as applied in claim 1, and further in view of U.S. Patent Application No. (US 2005/0025973) (Slutz et al.).

Rejections under 35 U.S.C. Section 103

Claims 1-3 and 5-10 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Lin et al. in view of Ichikawa et al. Applicants respectfully traverse the rejection.

Lin et al. discloses a method for forming an electrical interconnect that includes interconnecting bumps that are formed on a circuit substrate using printing or dispensing techniques with a wet photoresist layer as a mask.¹ In particular, Lin et al. discloses a method comprising the steps of: providing a substrate; forming a conductive layer on a portion of the substrate; forming a wet photoresist layer on the substrate and the conductive layer; patterning the wet photoresist layer to form openings to the conductive layer; disposing a conductive paste in at least the openings to the conductive layer; heating the conductive paste a first time at a temperature above room temperature; removing the wet photoresist layer; and heating the conductive paste at a temperature above room temperature a second time after the step of removing the wet photoresist layer.² More specifically, Lin et al. discloses *sweeping* 42 the conductive paste 30 with a squeegee 40 across the wet photoresist layer 15, forcing the conductive paste 30 into openings 20 and removing the excess conductive paste 30 off of photoresist mask 15; or *applying pressure* to the conductive paste 30 through any means, such as

¹ Lin et al. at ABSTRACT.

² *Id.* at FIG. 1 – FIG. 7, column 6, lines 6-23.

Application Serial No.: 10/710,870

Attorney Docket No.: 00131-00322-US1

a disk 50, that forces conductive paste 30 into openings 20 and removing the excess conductive paste 30 off of photoresist mask 15 (emphasis added).³

However, Lin et al. nowhere discloses, as recited in claim 1:

polishing the conductive polymer layer to remove excess conductive polymer material from a surface of the photoresist (emphasis added).

That is, as discussed above, Lin et al. discloses either *sweeping* 42 the conductive paste 30 with a *squeegee* 40 or *applying pressure* to the conductive paste 30 “to remove excess conductive paste 30.”⁴ In contrast to Lin et al., claim 1 recites the limitation of “polishing the conductive polymer layer to remove excess conductive material.”

In addition, paragraph 4, lines 1-6 of the outstanding Office Action indicates the statement in Lin et al. that “the surface of the conductive paste 30 is *planer* ... having substantially the same height” *inherently teaches* the step of polishing the conductive polymer layer (emphasis added). Applicants respectfully disagree.

Applicants respectfully point out that the Manual of Patent Examining and Procedure (MPEP) Section 2112 (IV) requires that the:

**EXAMINER MUST PROVIDE RATIONALE OR EVIDENCE
TENDING TO SHOW INHERENCY.**

In particular, MPEP Section 2112 (IV) states:

[t]he fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic.⁵

More specifically, MPEP Section 2112 (IV) states:

[i]n relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art.⁶

³ *Id.* at FIG. 3 – FIG. 4, column 3, lines 39-67.

⁴ *Id.* at FIG. 3 and FIG. 4; column 3, lines 39-60;

⁵ *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993).

⁶ *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990).

Application Serial No.: 10/710,870

Attorney Docket No.: 00131-00322-US1

Thus, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art. It is respectfully requested that the Examiner provide this information before making the outstanding Office Action final.

In contrast to the allegation of inherency in the outstanding Office Action, it is respectfully submitted that the allegedly inherent characteristic does not necessarily flows from the teachings of Lin et al. In particular, Applicants submit that the surface of the conductive paste being “planer,” as recited in Lin et al., clearly does *not inherently teach* the limitation of “polishing,” as recited in claims 1 and 10. To emphatically prove this point, one need only reference the words of Lin et al. cited in the outstanding Office Action in context. In particular, the entire statement from Lin et al. is as follows:

[i]n a preferred embodiment, *conductive paste 30 fills opening 20 so that the surface of conductive paste 30 is planer with wet photoresist layer 15 in order to provide interconnect bumps having substantially the same height (emphasis added).*⁷

The specifics of how the conductive paste 30 is made to fill the openings 20 so that “the surface of the conductive paste 30 is planer” is provided by further examining the context in which Lin et al. makes the above statement. In particular, Lin et al. discloses:

*a squeegee 40 or other suitable instrument is used to sweep conductive paste 30 across wet photoresist layer 15 thereby forcing conductive paste 30 into openings 20 and removing the excess conductive paste 30 off of photoresist mask 15. It is necessary to substantially fill openings 20 and to substantially remove excess conductive paste 30 from the surface of wet photoresist layer 15 (emphasis added).*⁸

That is, Lin et al. explicitly teaches, “a squeegee 40 or other suitable instrument is used to sweep conductive paste 30 across wet photoresist layer 15 thereby forcing conductive paste 30 into openings 20. Moreover, Lin et al. discloses that the step of “forcing conductive paste” into openings 20 with the squeegee is “necessary” and “fills the openings 20 so that the surface of conductive paste 30 is planer.”

⁷ See Lin et al. at column 4, lines 12-16.

⁸ *Id.* at column 3, lines 40-47.

Application Serial No.: 10/710,870

Attorney Docket No.: 00131-00322-US1

Thus, it is respectfully submitted that the above discussion indicates that the statement, which was referenced in the outstanding Office Action, as inherently teaching "polishing" due to the use of the term "planer," clearly does *not* explicitly nor inherently teach or suggest the step of "polishing" as recited in the claims 1 and 10 of the invention.

Furthermore, the specification of the invention *explicitly teaches away from the use of "squeegee-based" or "pressure-based" approaches* and includes test results emphasizing the benefits of "polishing," as recited in claims 1 and 10.⁹ Thus, Lin et al. not only does not disclose the claimed invention but it in fact *teaches away* from the claimed invention by disclosing the use of "squeegee-based" or "pressure-based" approaches. Therefore, it is respectfully submitted that and that claim 1 and claim 10, and claims dependent thereon, patentably distinguish thereover.

Furthermore, the outstanding Office Action acknowledges other deficiencies of Lin et al. and attempts to overcome these deficiencies by combining Lin et al. with Ichikawa et al.¹⁰ However, Ichikawa et al. cannot overcome the deficiencies of Lin et al., *as discussed above*, with regards to the claimed invention.

Ichikawa et al. discloses an Electro-Static Discharge (ESD) structure that is created on an integrated circuit by providing a conductive polymer material between a signal line and a supply node or ground reference.¹¹ In addition, Ichikawa et al. discloses that the conductive polymer material becomes conductive when an electric field of sufficient intensity is applied.¹²

However, Ichikawa et al. nowhere discloses, as recited in claim 1:

*polishing the conductive polymer layer to remove excess
conductive polymer material from a surface of the photoresist
(emphasis added).*

That is, in contrast to Ichikawa et al., claim 1 and claim 10 recite the limitation of "polishing the conductive polymer layer to remove excess conductive material." *Since nothing in Ichikawa et al. has been cited that discloses this limitation, Ichikawa et al. cannot overcome the deficiencies of Lin et al.*

⁹ Specification at paragraphs 15 and 51-55.

¹⁰ Outstanding Office Action, page 2, paragraph 3f.

¹¹ Ichikawa et al. at ABSTRACT.

Application Serial No.: 10/710,870

Attorney Docket No.: 00131-00322-US1

Therefore, it is respectfully submitted that neither Lin et al. nor Ichikawa et al., whether taken alone or in combination, disclose, suggest or make obvious the claimed invention and that claim 1, claim 10 and claims dependent thereon, patentably distinguish thereover.

Claim 4 was rejected under 35 U.S.C. 103(a) as being unpatentable over Lin et al. in view of Ichikawa et al., as applied in claim 1, and further in view of Slutz et al. Applicants respectfully traverse the rejection.

Claim 4 ultimately depends upon claim 1. As discussed above, neither Lin et al. nor Ichikawa et al., whether taken alone or in combination, disclose the limitations of claim 1. Thus, at least for the reasons discussed above, neither Lin et al. or Ichikawa et al., whether taken alone or in combination, disclose the limitations of claim 4.

In addition, the outstanding Office Action acknowledges other deficiencies of Lin et al. and Ichikawa et al. and attempts to overcome these deficiencies by combining Lin et al. and Ichikawa et al. with Slutz et al.¹³ However, Slutz et al. cannot overcome the deficiencies of Lin et al. and Ichikawa et al., as discussed above, with regards to the claimed invention as will be discussed below.

Slutz et al. discloses a composite material and the method of making same, which comprises a CVD diamond coating applied to a composite substrate of ceramic material and an unreacted carbide-forming material of various configurations and for a variety of applications.¹⁴

However, Slutz et al. nowhere discloses, as recited in claim 1 and claim 4:

*polishing the conductive polymer layer to remove excess
conductive polymer material from a surface of the photoresist
(emphasis added).*

That is, in contrast to Slutz et al., claim 1 and claim 4 both recite the limitation of "polishing the conductive polymer layer to remove excess conductive material." *Since nothing in Slutz et al. has been cited that discloses this limitation, Slutz et al. cannot overcome the deficiencies of Lin et al. and Ichikawa et al.*

¹² *Id.*

¹³ Outstanding Office Action, page 2, paragraph 4.

¹⁴ Slutz et al. at ABSTRACT.

Application Serial No.: 10/710,870

Attorney Docket No.: 00131-00322-US1

Therefore, it is respectfully submitted that none of Lin et al., Ichikawa et al. nor Slutz et al., whether taken alone or in combination, disclose the claimed invention and that claim 1, claim 4 and claims dependent thereon, patentably distinguish thereover.

Conclusion

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

Dated: December 27, 2005
436155_1

Respectfully submitted,

By Myron K. Wyche
Myron K. Wyche

Registration No.: 47,341
CONNOLLY BOVE LODGE & HUTZ LLP
1990 M Street, N.W., Suite 800
Washington, DC 20036-3425
(202) 331-7111
(202) 293-6229 (Fax)
Agent for Applicant